END SEMESTER EXAMINATION MAY-2023

Course Name: - B.tech **Semester:- 2nd**

Paper Name: - Engineering Chemistry **Paper Code:- TBS203**

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. **Max Marks-70**

समय– 3 घण्टे + 20 मिनट प्रति घंटे अतिरिक्त–दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए। अधिकतम अंक–70

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries 3 mark. All questions are compulsory.
- Section B- Answer any 5 out of 6 given questions in maximum hundred (150) words. Each question carries 7 marks.
- Section C- Answer any 2 out of 3 given questions in maximum five hundred (500) words. Each question carries 10 marks.

निर्देश:

- प्रश्न पत्र में तीन खण्ड अ, ब, व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड–अ में प्रत्येक प्रश्न तीन अंक का है। सभी प्रश्न अनिवार्य हैं।
- खण्ड–ब में छः प्रश्नों में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें। प्रत्येक प्रश्न सात अंक का है।
- खण्ड–स में तीन प्रश्नों में से किन्हीं दो प्रश्नों के उत्तर अधिकतम (300) शब्दों में दें। प्रत्येक प्रश्न 10 अंक का है।

Section – A (खण्ड–अ)

Objective Questions (वस्तुनिष्ठ प्रश्न)

5×3 =15

1. Answer all the following questions.
निम्नलिखित सभी प्रश्न अनिवार्य हैं।

i) No of Pi electrons , magnetic character and magnetic moment in F_2
   a) 8, Paramagnetic, 2.5
   b) 8, Diamagnetic, 0
   c) 8, Paramagnetic, 2.0
   d) 8, Diamagnetic, $\sqrt{3}$

ii) Degree of hardness caused by 50 ppm of $MgCl_2$ and 50 ppm $CaCl_2$ is
   a) 94.6 mg/L
   b) 97.6 mg/L
   c) 90.2 mg/L
   d) 102.3 mg/L

iii) Correct Monomer & polymer pair is,
   a) 1,3 Butadiene + Urea = Styrene
   b) 1,3 Butadiene + acrylonitrile = Buna-N
   c) Glycerol + Terephthalic acid =Dacron
   d) Glycerol + Phthalic acid =Glyptal

iv) Correct Bond order increasing order is,
   a) $O_2^- < F_2 < N_2 < C_2$
   b) $F_2 < O_2^- < N_2 < C_2$
   c) $O_2^- < F_2 < C_2 < N_2$
   d) $F_2 < C_2 < O_2^- < N_2$

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v) Degree of freedom when iron react with water vapour and produce iron oxide and hydrogen gas.
   a) 0
   b) 1
   c) 2
   d) 3

Section – B (खण्ड–ब)
Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any five of the following questions in maximum 150 words. **5×7=35**
निम्नलिखित में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें।

i. What are Zeolite? Explain their water softening nature using equations and figure.
ii. Define electrochemical theory of Corrosion. Give detail about any five affecting factors.
iii. Give five difference between Frankel and Schottky Defect including structure and example.
iv. Draw MO Diagram of di negative fluorine molecule.
v. Write % composition of cement.
vi. What are Lubricants? Classify them on the basis of Temperature range and State of matter.
vii. What are Biodegradable polymer? Draw Structure of PHBV.

Section – C (खण्ड–स)
Descriptive Questions (विवरणात्मक प्रश्न)

3. Answer any two of the following question in maximum 300 words. **2×10=20**
निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 300 शब्दों में दें।

i) What are liquid crystal? Explain with types, uses and structure.
ii) Draw Phase diagram of water system with all the possibilities of area and curve using phase rule.
iii) Calculate temporary, permanent and total hardness of a water sample having 10,20 and 25 ppm of $CaCl_2$, $Mg(HCO_3)_2$ and $MgCO_3$ respectively.

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